

Maryland Department of Health and Mental Hygiene
Summary of the Pandemic Influenza School System
Tabletop Exercise

February 10, 2006

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Executive Summary

Background

 On August 3, 2005, a pandemic influenza tabletop exercise was held in Ellicott City, Maryland. Sponsored by the Maryland Department of Health and Mental Hygiene (DHMH), Maryland Partnership for Prevention (MPP), and the Maryland State Department of Education (MSDE), the exercise addressed school system participation in a simulated response to pandemic influenza, and represents the first statewide joint school system/public health exercise on this topic in Maryland and to our knowledge, the first in the United States.

An influenza pandemic – a global outbreak of influenza – is of mounting concern to public health authorities around the world. Health officials estimate a pandemic in the U.S. can sicken 30% of the population or 90 million individuals, half of whom will seek outpatient medical care. The number of hospitalizations and deaths will depend on the virulence of the pandemic virus. In the absence of interventions such as vaccine or antiviral drugs, it is estimated that in Maryland alone a “moderate” pandemic could cause approximately 10,000 deaths, 44,500 hospitalizations, and over 1 million illnesses.

The purpose of the Maryland Pandemic Influenza Tabletop School System Exercise was to explore school-related issues, response roles, and decision-making in the context of a simulated event. The thirty-three exercise participants included Maryland state and local school system and public health personnel, invited from the State’s 24 political jurisdictions, as well as representatives from the State Parent-Teacher Association, the Maryland Institute for Emergency Medical Services Systems (MIEMSS) and the Maryland Emergency Management Agency (MEMA). Joining them were approximately seventy-five observers representing similar disciplines. The exercise was a product of recommendations from a 2004 statewide pandemic influenza exercise, also sponsored by DHMH and MPP, which identified the need to enhance school system readiness.

The objectives for the school system tabletop exercise included:

1. Increase school community awareness of the scope, severity, and impact of an influenza pandemic.
2. Identify issues, challenges, options, and implications for schools concerning pandemic response.
3. Identify indicators (e.g., staff absence level, illness threshold, etc.) that might be important for making decisions regarding school closure and re-opening.

Key Findings

Key findings are outlined below. Detailed findings are provided in the full Report. The findings are based on the testimony of exercise participants, observations made by the exercise planners and facilitators, an analysis of research literature and policy documents, and comments from exercise participants and observers.

1. Current local school plans do not address pandemic influenza.
2. Current pandemic influenza preparedness plans do not sufficiently address school systems.
3. Gaps are present in communication needed to ensure timely and effective exchange of information during an influenza pandemic.
4. School systems lack specific guidance and procedures on a myriad of issues relevant to an influenza pandemic.

Recommendations

Recommendations are summarized here. These are offered without accounting for the availability of financial or other resources that may be needed for their implementation.

1. MSDE, in consultation with DHMH, should provide guidance to school systems in their pandemic influenza preparedness efforts. A school system pandemic influenza planning template could be created and incorporated into already established emergency response plans to provide a standardized approach for Maryland schools to develop a response plan specific to their jurisdiction but compatible with those of other jurisdictions. Types of information that could be included in such a framework are contact lists and call-down trees, public information key messages, a roster of personnel and special skills, an inventory of facilities, vehicles, and equipment that might be effectively repurposed during an influenza pandemic.
2. MSDE should encourage local school jurisdictions to prepare and test pandemic influenza response plans, promote awareness and train personnel on their roles and responsibilities as specified within these plans. **Pandemic influenza response plans should be integrated with other local emergency preparedness efforts and regularly reviewed, practiced and updated.**
3. DHMH, in consultation with MSDE, should develop a pandemic influenza decision matrix. This instrument could be used to establish potential thresholds and associated actions that would guide school systems and public health personnel concerning when a specified course of action is indicated and how to effect that action.
4. MSDE should encourage local school jurisdictions to develop and test comprehensive communications protocols that ensure rapid and effective alerting,

notification, and message exchange with staff, students, and parents.

5. DHMH and MSDE should jointly develop a communication protocol between school systems and public health at both the local and state level. The protocol should identify circumstances triggering notification between entities and the proper form and routing of these contacts. In addition, it should consider existing and needed communications infrastructure such as a school health emergency list serve, dedicated conference lines, and other capacities as necessary.
6. DHMH and MSDE should encourage procedures for school systems and public health agencies during an influenza pandemic be developed on each of the following topics:
 - a. school closure and re-opening;
 - b. cancellation or suspension of school events and extracurricular activities;
 - c. repurposing of school facilities, equipment and vehicles;
 - d. re-assignment of non-school system employees (e.g., school nurses employed by the local health department);
 - e. school-based infection control measures during an influenza pandemic;
 - f. screening of students and staff; and
 - g. recommendations regarding vaccine and antiviral drugs for school staff and students.

Conclusion

Since 1999, Maryland has benefited from collaborative influenza pandemic planning and preparedness efforts, lead by DHMH and with the participation of MSDE and a wide range of other agencies. This has resulted in a strong foundation from which additional capacity-building is now proceeding. One example is engaging school systems in preparing for their important role in responding to an influenza pandemic. The tabletop exercise reported here provided the opportunity to substantially advance this goal.

The tabletop exercise demonstrated the active interest among school system, public health, and other agencies, in furthering pandemic influenza preparedness using a coordinated, collaborative approach. This approach builds on several unique assets that support close cooperation on matters relating to school health. Among these is the DHMH school health liaison to MSDE, two MSDE school health services specialists, a MSDE safety specialist, the Maryland State School Health Council, regulations supporting joint local planning on school health issues, and the presence of school nurses in every jurisdiction, some of which are employed by the local public health agency.

The tabletop exercise also demonstrated that much work remains to be done in order to ensure that school systems are prepared to respond to a pandemic influenza event, and exercise participants offered substantive insight into ways in which this can be accomplished. It is important that the momentum established by this exercise not be lost, and that continued forward progress be made to integrate school system response issues into existing plans, and to develop appropriate procedures and protocols to guide an effective response.

International concern regarding the near-term possibility of an influenza pandemic has arguably never been greater. By applying the findings and recommendations from this tabletop exercise, the potential is also great for achieving lasting capacity enhancements and setting an example for others to follow.

Background

An influenza pandemic is a global outbreak of disease that occurs when a new influenza A virus appears in the human population, causes serious illness, and then spreads easily from person to person worldwide. Pandemics are different from seasonal outbreaks of influenza. Seasonal outbreaks are caused by subtypes of influenza viruses that are already in existence among people, whereas pandemic outbreaks are caused by new subtypes that have never circulated among people before or that have not circulated among people for a long time. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss.

While no one can predict the timing or severity of the next influenza pandemic, many public health officials believe that another influenza pandemic is inevitable. Health officials estimate a pandemic in the U.S. can sicken 30% of the population or 90 million individuals, half of whom will seek outpatient medical care. The number of hospitalizations and deaths will depend on the virulence of the pandemic virus. In the absence of interventions such as vaccine or antiviral drugs, it is estimated that in Maryland alone a “moderate” pandemic could cause approximately 10,000 deaths, 44,500 hospitalizations, and over 1 million illnesses.

Influenza pandemics are unlike any other public health emergency or community disaster:

- The pandemic will last much longer than most other emergency events and may include “waves” of influenza activity separated by months (in 20th century pandemics, a second wave of influenza activity occurred 3 to 12 months after the first wave).
- The numbers of health-care workers and first responders available to work can be expected to be reduced; they will be at high risk of illness through exposure in the community and in health-care settings, and some may have to miss work to care for ill family members.
- The pandemic will be widespread, with outbreaks expected to occur simultaneously throughout much of the U.S., preventing shifts in human and material resources that normally occur with other natural disasters.
- Effective preventive and treatment measures – including vaccines and antiviral agents – will likely be in short supply.

Because of these unique features of a pandemic and the expected impact of such an event, advance planning across all sectors of society, including school systems, is critical.

School systems represent an important element in pandemic influenza preparedness and response for several reasons:

- *Schools are potential sites for the spread of disease, including influenza.* Because they are locations where significant numbers of persons (students and staff) routinely assemble, schools are potential sites where disease, including

influenza, may be acquired or spread. In addition, school children are primary transmitters of influenza to their community. Compared to adults, children are more likely to be infected with influenza each year and shed influenza virus longer and in larger quantities.

- *Schools are an information source for community residents.*
Over 23% of Maryland households include parents and one or more children¹. This large population group forms an important constituency for schools. Because of their established position within the community, schools also serve as focal points for information exchange and services delivery.
- *Schools are sources of valuable resources for emergency response.*
In addition to their instructional activities, schools possess a variety of important assets. Personnel resources include healthcare and mental health professionals, foreign language staff, and information technologists. Many school bus systems are their jurisdiction's largest transportation system. Similarly, school cafeterias may represent a significant proportion of the community's food services infrastructure. Audiovisual and computer technology are increasingly a common school system resource. Collectively, these assets may become important resources during a community response to pandemic influenza.
- *Schools are sources of health monitoring information.*
Because of their routine contact with a large proportion of the population, schools afford opportunities for monitoring the public's health status. In Maryland, school personnel are required to report to the local health department all suspected or diagnosed cases of reportable communicable disease². If there were indications of an approaching influenza pandemic, schools might be enlisted to monitor students or staff for influenza-like illness³.

The Maryland State Department of Education (MSDE), with guidance from the Maryland State Board of Education, develops and implements educational program policy and standards for the state's public school system (K-12th grade). This organizational structure is replicated at the local level. Each of Maryland's 24 political jurisdictions has a school superintendent and a local school board. Collectively, they set local school district policies and procedures, including decisions regarding school closure. Within individual schools, a principal serves as the lead administrative authority; with the scope of their authority varying according to policies established by each superintendent and local school board.

There are 1,409 public schools in Maryland, enrolling nearly 870,000 students⁴. Maryland's smallest jurisdiction has 8 public schools – its largest has 203. Collectively, over 107,000

¹ "Maryland's Demographic Diversity," Maryland Department of Planning, Maryland State Data Center (2000 census; < http://www.mdp.state.md.us/msdc/census/cen2000/SF1/demo_diversity/demodiv.pdf > accessed September 22, 2005)

² Code of Maryland Regulations (COMAR) 10.06.01

³ Fujii H, Takahashi H, Ohyama T, Hattori K and Suzuki S, "Evaluation of the School Health Surveillance System for Influenza, Tokyo, 1999-2000," Japanese Journal of Infectious Disease, 55:2002; 97-99.

⁴ "The Fact Book: 2003-2004: A Statistical Handbook," Maryland State Department of Education (2004)

full-time-equivalent staff are employed by public schools statewide; approximately 73,000 of these are instructional staff. Statewide, Maryland's schools operate approximately 3,600 vehicles and contract for over 3,160 more. During the 2003-2004 academic year, Maryland public schools served over 67,878,000 school lunches.

Maryland school systems are actively engaged in public health activities in a number of ways. School nurses are employed, either by the local school board or by the local health department, to meet a variety of healthcare needs. Maryland regulations also provide for school systems to work with MSDE, DHMH, and local public health agencies to document physical examinations of students, review student health records, and perform health appraisals of students with health concerns.⁵ Effective January 6, 2005, each local school system and school must also develop an emergency plan that addresses mitigation, preparation, response and recovery for man-made, technological, and natural hazards, including events in the community that affect normal school functioning.⁶ An annual drill (exercise) of all or portions of each plan is also required. School system personnel collaborate with public health and other local officials in developing these plans. In addition, a DHMH physician specifically serves as liaison to MSDE, meets regularly with MSDE counterparts, and is an integral part of MSDE activities relating to health.

Since 1999, DHMH has undertaken leadership actions to prepare for pandemic influenza. DHMH has coordinated the participation of dozens of state and local agencies and border-jurisdictions in developing a comprehensive statewide plan for responding to an influenza pandemic. The Plan – currently a strategic framework – sets forth the responsibilities of various response partners and outlines a mechanism for decision-making during a pandemic event. The Plan is currently undergoing major revision to make it more operational and reflect the national pandemic influenza plan released in November 2005. In the spring of 2004, DHMH and MPP sponsored a pandemic influenza tabletop exercise for response agencies across the state, including neighboring jurisdictions.⁷ One of the issues identified through that exercise was the desirability to further collaboratively develop the capacity of the state's public school systems to prepare for and respond to an influenza pandemic. On this basis, DHMH in collaboration with MSDE and MPP, sponsored a pandemic influenza tabletop exercise on August 3, 2005, focusing on the role of schools.

The exercise was staged as a workshop within the state's annual School Health Interdisciplinary Program, a continuing education forum for education and health professionals. The thirty-three exercise participants included Maryland state and local school system and public health personnel, invited from the State's 24 political jurisdictions, as well as representatives from the State Parent-Teacher Association, the Maryland Institute for Emergency Medical Services Systems (MIEMSS) and the Maryland Emergency Management Agency (MEMA). Joining them were approximately seventy-five observers representing similar disciplines.

⁵ Code of Maryland Regulations (COMAR) 13A.05.05.07

⁶ Code of Maryland Regulations (COMAR) 13A.02.02

⁷ Taylor JL, Roup BJ, Blythe D, Reed GK, Tate TA, Moore KA. Pandemic influenza preparedness in Maryland: improving readiness through a tabletop exercise. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 2005;3:61-69.

The objectives for the school system tabletop exercise included:

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3. Identify indicators (e.g., staff absence level, illness threshold, etc.) that might be important for making decisions regarding school closure and re-opening.

An exercise scenario was developed, chronologically simulating a pandemic influenza event in four episodes; the recently revised WHO pandemic influenza response guidelines were used to guide this development. A series of questions and follow-up probes were developed for the exercise facilitator to pose to participants. Questions were designed to promote discussion of various exercise elements represented in each exercise episode.

Findings

The following findings are based on the testimony of exercise participants, observations made by the exercise planners and facilitators, an analysis of research literature and policy documents, and comments from exercise participants and observers.

1. Current local school plans do not address pandemic influenza.

Every Maryland school system and school is required to have an emergency plan.⁸ A particular strength is Maryland's recent enactment of regulations that ensure collaboration between local school systems and local public health agencies in planning and response to school health problems. However the exercise demonstrated that currently no Maryland school system has developed plans specifically for the management of pandemic influenza. A number of participants noted the need for a coordinated approach to develop local plans according to uniform standards. One participant described this as a need to "...get a statewide policy so that every (school) district knows exactly what to do and not everyone is developing different policies, because a lot of students travel from county to county."

2. Current pandemic influenza preparedness plans do not sufficiently address school systems.

Under the leadership of DHMH, the State's pandemic influenza plan has been collaboratively developed and revised with the involvement of a wide range of input. However roles and responsibilities for school systems have yet to be delineated and incorporated into the State's plan. Exercise participants indicated a need to formulate such actions. In addition, during the exercise, only a few local health departments indicated that they have developed response plans specific to pandemic influenza. Of these plans, the role of school systems was insufficiently addressed.

3. Gaps are present in communication needed to ensure timely and effective exchange of information during an influenza pandemic.

- Participants expressed a need for enhanced communications on all levels -- between public health and school authorities and vertically within school systems -- to ensure timely and effective exchanges during an influenza pandemic. Almost all participants commented on the priority that should be given to establishing solid communications pathways and information flows in advance of a pandemic influenza event. One participant identified the "...need for a communication coordinator" as the most important issue from the exercise.
- The exercise demonstrated that good cooperation and communication characterizes the current relationships between most school systems and public health agencies. School systems rely upon public health officials as trusted sources of guidance on disease prevention and control and on additional health-

⁸ Code of Maryland Regulations (COMAR) 13A.02.02.

related matters. In most school systems, public health personnel are easily accessed. Public health agency participants identified a number of issues upon which they would likely depend on close communications with school systems during a pandemic including: staff and student absenteeism; school demographics; contact lists of school personnel, alerting and notification procedures; and contents of school emergency response plans and procedures.

- Exercise participants noted that public health and school system personnel use different vocabularies in communicating with each other and the public. Participants remarked on the need to define certain terms (surveillance, quarantine, isolation, incubation, exposure, etc.), and to educate response personnel accordingly.
 - Among the specific communication needs identified by participants were:
 - Inter- and intra-agency communications plans and templates, and the advance establishment of coordinated pathways for inter- and intra-agency communications during an influenza pandemic;
 - Protocols for the notification, alerting, and briefing personnel;
 - Calling trees and regularly updated lists of emergency contact telephone numbers and e-mail addresses for staff, workers, students, families, and public health officials; and
 - Advance preparation of health messages as an effective way to coordinate and streamline communications during an emergency.
4. School systems lack specific guidance and procedures on a myriad of issues relevant to an influenza pandemic.
- Participants noted that continuity of operations during an influenza pandemic, where absenteeism could be as high as 30% for over 8 weeks, would require procedures different from those currently in place. Among examples identified by participants include school closure and re-opening, cancellation or suspension of school events and extracurricular activities, repurposing of school facilities, equipment and vehicles, re-assignment of non-school system employees, school-based infection control measures during a pandemic, potential cohorting of school classes, modifications in transportation and food services, and other issues. It was clear during the exercise that the likely duration of an influenza pandemic would result in significant management challenges to school systems and public health agencies, impacting both routine and emergency operations. “We have plans in place for short term (emergencies) but not for long,” noted one school system participant. A majority of participants indicated that, particularly for school systems, “...clear and concise protocols...” are needed for a variety of actions in an influenza pandemic.

- The exercise also made clear that the absence of scientific or policy guidance on threshold indicators was a barrier in effective decision-making. Participants from the school system and public health communities expressed a need for criteria upon which to base specific actions.
- An important factor, noted by almost all participants, was the need to adequately inform parents and caregivers, and to consider the likely inclination of many parents to seek alternative sources of childcare which might counter the potential benefits of school closure. One participant noted that the discussion regarding “...(school) closure decision making process...” as the most valuable part of the exercise.
- School system participants clearly indicated that screening students for influenza-like illness at the beginning of each day would be logistically overwhelming and, in their opinion, infeasible. Similarly, school system and public health participants felt that they could not rely on parents to appropriately screen students prior to sending them to school.
- Participants noted that school systems could experience unanticipated requests for resources needed within the community to prevent or contain an influenza pandemic. Examples discussed among the participants included the use of schools as vaccination and dispensing sites, requests for staff to assist with community-based interventions, requests for equipment and vehicles, and the use of school food services to support responders and home-bound citizens. It was clear that there is a need for procedures and policies to coordinate and monitor such requests, and to aid school system and public health personnel when implementing them.
- Approximately 50% of Maryland public school nurses are employed and supplied by the local public health agency. Participants noted that in a pandemic, these school nurses may likely be re-assigned to perform other duties.
- Participants noted that many schools have been designated as vaccination or mass-dispensing sites under existing plans for responding to bioterrorism. Participants also noted that most schools do not have available specific guidance on how to respond to requests to “re-purpose” their facilities, equipment, and staff during a pandemic influenza event. Several school system participants reported having been previously asked by local public health officials to serve as sites for screening and immunization clinics, and even as in-patient, isolation, and quarantine facilities, if necessary. However, it was clear from participant discussions during the exercise that there is presently no common, coordinated approach to processing and fulfilling such requests. In addition, a school official expressed concern that students, parents, and staff might have reservations about returning to a school which had been occupied by influenza patients.

Recommendations

The following recommendations are based on the findings of this report. These recommendations are offered without accounting for the availability of specified financial or other resources that may be needed for their implementation.

1. MSDE, in consultation with DHMH, should provide guidance to school systems in their pandemic influenza preparedness efforts. A school system pandemic influenza planning template could be created and incorporated into already established emergency response plans to provide a standardized approach for Maryland schools to develop a response plan specific to their jurisdiction but compatible with those of other jurisdictions. Types of information that could be included in such a framework are contact lists and call-down trees, public information key messages, a roster of personnel and special skills, an inventory of facilities, vehicles, and equipment that might be effectively repurposed during an influenza pandemic.
2. MSDE should encourage local school jurisdictions to prepare and test pandemic influenza response plans, promote awareness and train personnel on their roles and responsibilities as specified within these plans. **Pandemic influenza response plans should be integrated with other local emergency preparedness efforts and regularly reviewed, practiced and updated.**
3. DHMH, in consultation with MSDE, should develop a pandemic influenza decision matrix. This instrument could be used to establish potential thresholds and associated actions that would guide school systems and public health personnel concerning when a specified course of action is indicated and how to effect that action.
4. MSDE should encourage local school jurisdictions to develop and test comprehensive communications protocols that ensure rapid and effective alerting, notification, and message exchange with staff, students, and parents.
5. DHMH and MSDE should jointly develop a communication protocol between school systems and public health at both the local and state level. The protocol should identify circumstances triggering notification between entities and the proper form and routing of these contacts. In addition, it should consider existing and needed communications infrastructure such as a school health emergency list serve, dedicated conference lines, and other capacities as necessary.
6. DHMH and MSDE should encourage procedures for school systems and public health agencies during an influenza pandemic be developed on

each of the following topics:

- a. school closure and re-opening;
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- f. screening of students and staff; and
- g. recommendations regarding vaccine and antiviral drugs for school staff and students.

Although data are limited, school closures may be effective in decreasing the spread of influenza and the risk of infection among children, as well as reducing the overall magnitude of disease in a community. Children are known to be efficient transmitters of seasonal influenza and other respiratory illnesses. However, closing schools has a significant impact on the community and workforce and careful consideration should be focused on their potential effectiveness and how school closure can most effectively be implemented. During an influenza pandemic, parents should be encouraged to consider child care arrangements that do not result in large gatherings of children outside the school setting.

In schools infection control for pandemic influenza should focus on (1) promoting hand washing and respiratory hygiene/cough etiquette (i.e., covering the mouth and nose when coughing and sneezing), and (2) keeping sick students, staff, and workers away from school while they are infectious. The benefits of wearing masks in schools have not been established. School administrators and employers should ensure that supplies for hand washing and respiratory hygiene/cough etiquette (e.g., tissues and receptacles for their disposal) are available.

Conclusion

The Institute of Medicine recently summarized the critical importance of preparing for pandemic influenza at the state and local level:

“The most direct, most primary response to pandemic influenza will come from state and local authorities, public health officials, and providers of medical and other public services. Unlike a typical, localized public health emergency or natural disaster, a pandemic disease cannot be managed from outside the affected community; each community must face the possibility of responding to influenza with minimal external resources or support – or none at all.”⁹

Since 1999, Maryland has benefited from collaborative influenza pandemic planning and preparedness efforts, lead by DHMH and with the participation of MSDE and a wide range of other agencies. This has resulted in a strong foundation from which additional capacity-building is now proceeding. One example is engaging school systems in preparing for their important role in responding to an influenza pandemic. The tabletop exercise reported here provided the opportunity to substantially advance this goal.

The tabletop exercise demonstrated the active interest among school system, public health, and other agencies, in furthering pandemic influenza preparedness using a coordinated, collaborative approach. This approach builds on several unique assets that support close cooperation on matters relating to school health. Among these is the DHMH school health liaison to MSDE, two MSDE school health services specialists, a MSDE safety specialist, the Maryland State School Health Council, regulations supporting joint local planning on school health issues, and the presence of school nurses in every jurisdiction, some of which are employed by the local public health agency.

The tabletop exercise also demonstrated that much work remains to be done in order to ensure that school systems are prepared to respond to a pandemic influenza event, and exercise participants offered substantive insight into ways in which this can be accomplished. It is important that the momentum established by this exercise not be lost, and that continued forward progress be made to integrate school system response issues into existing plans, and to develop appropriate procedures and protocols to guide an effective response.

International concern regarding the near-term possibility of an influenza pandemic has arguably never been greater. By applying the findings and recommendations from this tabletop exercise, the potential is also great for

⁹ The Threat of Pandemic Influenza: Are We Ready? Institute of Medicine, National Academy of Sciences, Washington, D.C., 2005:24.

achieving lasting capacity enhancements and setting an example for others to follow.